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Record of Decision:

F.E. WARREN AIR FORCE BASE
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RECORD OF DECISION
INTERIM ACTION
OPERABLE UNIT 8: LANDFILL 5A

F.E. WARREN AIR FORCE BASE, WYOMING

OCTOBER 3, 1996

U.S. AIR FORCE
FINAL DOCUMENT

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DECLARATION FOR THE RECORD OF DECISION
INTERIM ACTION
OPERABLE UNIT 8: LANDFILL 5A

1.0 SITE NAME AND LOCATION

F.E. Warren Air Force Base
Cheyenne, Wyoming

2.0 STATEMENT OF BASIS AND PURPOSE

The selected interim action (remedy) for Operable Unit 8 (OU8), Landfill 5A (LF5A), at F.E. Warren Air Force Base (Base), in Cheyenne, Wyoming includes CAPPING and an active gas venting system. The selected action, the fifth at the Base, was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The selected remedy addresses only source control at LF5A, a portion of OU8. This decision is based on the Administrative Record for the site. The United States Environmental Protection Agency (EPA) and State of Wyoming Department of Environmental Quality (WDEQ), as oversight agencies, concur with the selected remedy. The United States Air Force is the lead agency for the site.

3.0 ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the remedy selected in this Record of Decision (ROD), may present a current or potential threat to public health, welfare, or the environment.

4.0 DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for LF5A is a source control action that includes capping, an active gas venting system and if needed, a gas control system for VOCs. OU8 is one of ten operable units to be investigated under terms of the Federal Facility Agreement (FFA). The others are: OU1 - Spill Sites 1 through 7; OU2 - Facility Ground Water (except at OUs 3, 6, 7 and 8), OU3 - Landfdls 3 and 6; OU4 - Acid Dry Wells; OU 5 - Fire Protection Training Area 2; OU 6 - Open Burning/Open Detonation Area; OU7 - Firing Ranges; OU9- Landfills 2 and 4; and OU10- Landfill 7 and Fire Protection Training Area 1. The ground water contamination associated with OUs 3, 6, 7, and 8 will be investigated and remediated as part of those OUs, separate from OU2. All of the investigations are being conducted in accordance with the FFA.

The function of the interim action is to control the LF5A site as a source of ground-water contamination by reducing infiltration and the downward movement of contaminants to the ground water, and to reduce the risks associated with exposure to contaminated materials. While the remedy addresses one of the principal threats at the site, the final remedial alternative will address remediation of the down-gradient contaminant plume.

The major components of the selected remedy include:

- Capping Landfill 5A in accordance with relevant and appropriate Resource Conservation and Recovery Act Subtitle D landfill closure requirements;
- Installing an active venting system to control methane production and a control system if required for VOCs;
- Installing erosion and surface water controls;
- Conducting environmental monitoring to ensure the effectiveness of the interim action.

5.0 STATUTORY DETERMINATIONS

The United States Air Force (USAF) has determined, with the concurrence of the Environmental Protection Agency, and the State of Wyoming, that this interim action is protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements directly associated with this action, satisfies the requirements for a waiver of any standards that won't be met, and is cost-effective. This action utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not

satisfy the statutory preference for treatment as a principal element of the remedy. The size of the landfill and the fact that there are no apparent on-site hot spots that represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. Because this action does not constitute the final remedy for LF5A, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed at the time of the final response action. Subsequent actions are planned to address fully the principal threats posed by LF5A.

CERCLA Section 121(c), 42 U.S.C. Section 9621(c), requires five-year reviews in the event that hazardous substances, pollutants or contaminants remain on site. The USAF will conduct reviews every five years after issuance of this ROD.

6.0 SIGNATURE OF AGENCY ACCEPTANCE OF REMEDY (EPA)

The undersigned representative concurs with this Record of Decision for Interim Action, Operable Unit 8: Landfill 5A, at F.E. Warren AFB, Wyoming.

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6.0 SIGNATURE OF AGENCY ACCEPTANCE OF REMEDY (WDEQ)

6.0 SIGNATURE OF AGENCY ACCEPTANCE OF REMEDY (USAF)

The undersigned representative concurs with this Record of Decision for Interim Action, Operable Unit 8: Landfill 5A, at F.E. Warren AFB, Wyoming.

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DECISION SUMMARY FOR THE RECORD OF DECISION
INTERIM ACTION
OPERABLE UNIT 8: LANDFILL 5A

1.0 SITE NAME, LOCATION, AND DESCRIPTION

F.E. Warren Air Force Base (Base), occupies approximately 5,866 acres immediately adjacent to the west side of the City of Cheyenne, Wyoming (Figure 1).

The Base was placed on the National Priorities List on February 21, 1990. Historically, the Base has served a number of military functions, including; cavalry outpost, quartermaster depot and intercontinental ballistic missile operations base. Operations began at the U.S. Army outpost named Fort D.A. Russell in 1867. The name was changed to Fort F.E. Warren in 1930. The Base was a major training facility during and after World War II. Fort F.E. Warren was transferred to the newly formed U.S. Air Force in 1947 and was subsequently named F.E. Warren Air Force Base. The Base underwent extensive renovation after World War II. The majority of the Army training facilities were torn down and not replaced. Construction since that time has centered on facilities for Air Force operations. Beginning in 1958, F.E. Warren Air Force Base became a Strategic Air Command (SAC) base. Since then, F.E. Warren Air Force Base has served as an operations center for, first, the Atlas Intercontinental Ballistic Missile (ICBM), followed by the Minuteman I and III and finally, the Peacekeeper (MX) ICBMs. The Base was part of Air Combat Command (ACC) from 1992 to 1993, and in July 1993, became part of Space Command.

F.E. Warren Air Force Base is bordered by agricultural land and rural or suburban residential areas. The Base contains 831 residential housing units and several unaccompanied personnel housing units (barracks), along with the services required by residents. The nearest residences to Landfill 5A (LF5A), are off-Base, approximately 750 feet to the south.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

LF5A is an area of about 15 acres located directly south of the Weapons Storage Area (WSA), north of Military Road, and west of Cheyenne Road as shown on figure 2. The estimated volume of fill at landfill 5 is 16,200,000 cubic feet, but the exact depth and thickness of landfill contents, and whether the other landfill units were included as part of this estimated volume are unknown. The landfill has a thin soil and grass cover. Depth to the water table in the LF5 area ranges from 8 to 37 feet below land surface. The 1985 records search indicated that landfill 5 operated from 1960 until 1970, and consisted of three burn pits and a series of trenches. The operation was a burn, trench and-fill, and cover operation. Refuse from the Base shops and housing areas was transported daily to the landfill. The refuse was deposited in one of the pits and burned for volume reduction; the residue was removed and placed in a trench, and covered with soil.

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Aerial photograph interpretations indicated that landfill 5A may have operated from 1959 to 1961, that operations may have been switched from landfill 5A to landfill 5B about 1961, that operations primarily were at landfill 5B between 1961 and 1966, that in 1966 operations decreased at landfill 5B and increased at landfill 5A, that in 1970 operations continued at landfill 5A but landfill 5B was re-vegetating and by 1976 re-vegetation was occurring at both landfill 5A and 5B. The Base refuse disposed of in landfill 5A was reported as domestic waste and shop wastes such as solvents, waste oils, ethylene glycol, silicone oil, hydraulic fluid, waste JP-4, batteries, battery acid, expired pesticides, old paint, asbestos insulation, and incinerator ash. Field reconnaissance observed the presence of ash, cinders, and construction debris on the surface. Extensive surface subsidence was observed in the area of the landfill 5A trenches. Water lines, sanitary sewers, natural gas lines, electrical power lines, communications lines, and cable-television lines are throughout the area, including within the boundaries of landfill 5A.

On September 26, 1991, a Federal Facility Agreement (FFA) was signed between the USAF, EPA, and WDEQ. The FFA is required by Section 120 of CERCLA. The FFA provides the framework for EPA and WDEQ oversight of continuing remedial investigations at the Base and further identifies USAF investigation activities and schedules. The Base provides documents to EPA and WDEQ for review and concurrence, in accordance with the FFA.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The USAF has prepared and implemented a community relations plan (CRP) in accordance with CERCLA requirements, and the FFA. The CRP describes community involvement activities the USAF will undertake during remedial activities at F.E. Warren Air Force Base. The USAF has followed the requirements of the CRP, including issuance of periodic fact sheets, holding public meetings, and providing the opporunity for public

comment throughout the LF5A investigation.

The Administrative Record has been established at an on-Base location and at the Laramie County Public Library. The USAF has prepared and distributed fact sheets to all persons or groups identified on the CRP mailing list.

The announcement of the commencement of the public comment period was made on October 8, 1995, through advertisements in the Wyoming Tribune-Eagle and in the Casper Star-Tribune. Additional announcements and articles on the public meeting and proposed plan were run in the Wyoming Tribune-Eagle on 21 and 31 October, 1995. These advertisements announced and outlined the public comment period and public meeting. The public comment period was scheduled from October 23 to November 21, 1995. A public meeting was held at Cheyenne, Wyoming on November 7, 1995. An official transcript of the meeting has been prepared and placed in the Administrative Record.

In addition to the newspaper announcements, the USAF also issued a press release and an article appeared in the Base Sentinel newspaper on October 13, 1995. The public meeting was also announced during the "Military Minute" on Cheyenne radio station KRAE on November 7, 1995. Channel 5, KWGN television carried a report on the public meeting on November 7, 1995.

Responses to all comments on the Proposed Plan are presented in the Responsiveness Summary of this ROD.

4.0 SCOPE AND ROLE OF OPERABLE UNIT

The selected interim action (remedy) for LF5A is a source control action that includes capping, an active gas venting system and, if needed, a gas control system for VOCs. Other Operable Units (OU's) at the Base are: OU1 - Spill Sites 1 through 7; OU2 - Facility Ground water (except at OUs 3, 6, 7 and 8), OU3 - Landfills 3 and 6; OU4 - Acid Dry Wells; OU 5 - Fire Protection Training Area 2 OU 6 - Open Burning/Open Detonation Area; OU7 - Firing Range(s); OU9- Landfills 2 and 4; and OU 10- Landfill 7 and Fire Protection Training Area 1. The ground water contamination associated with OUs 3, 6, 7, and 8 will be investigated and remediated as part of these OUs, separate from OU2. All of the investigations are being conducted in accordance with the FFA. It is anticipated that the ROD for OU2 will be issued after the RI has been completed for the other operable units.

5.0 SITE CHARACTERISTICS

LF5 is the source of several chemicals found in ground water at concentrations in excess of Federal drinking water standards. The chemical most frequently detected is trichloroethylene (TCE), considered to be a suspected carcinogen.

No specific characterization has been performed for the landfill contents. Based on the EPA guidance on presumptive remedies for landfills, the source of contamination is considered to be the entire landfill area.

At LF5A, cores from 14 shallow-soil boreholes were sampled and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organo-chlorine pesticides, polychlorinated biphenyls (PCBs), metals, anions, and moisture content. No target analyte SVOCs were detected; however a number of SVOC tentatively identified compounds (TICs) were found in the soils. The pesticides 4,4'-DDT and 4,4'-DDE were detected in one of the 14 samples. Surface samples from four selected boreholes at LF5A were analyzed for polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). None were detected at LF5A.

Soil-gas samples were analyzed from 14 sites corresponding to the soil boreholes. Methane was not detected, however, because only 5 of the sample locations were within the LF5A boundary, the presence of methane could not be ruled out. Samples from two of the 14 sites showed detectable vinyl chloride, one of the two sites also had detectable TCE.

A series of 29 test wells were installed and sampled for field screening purposes. Ground-water samples were collected and analyzed for vinyl chloride, trans- 1,2-dichloroethene, cis-1,2-dichloroethene, benzene, TCE, chloride, nitrate, and sulfate. Tetrachloroethene was analyzed for in four of the LF5A samples. TCE was detected in seven of the samples, with a maximum concentration of 4.4 ug/L. Vinyl chloride was detected in 23 of the samples, with five having concentrations in excess of the Maximum Contaminant Level (MCL) of 2 ug/L and with a maximum concentration of 4.4 ug/L. Nitrate was detected in one well at a concentration above the MCL of 10 mg/L. A high sulfate level and high specific conductance (a measure of total dissolved solids) were detected in the same well as the maximum TCE concentration.

None of the base wide surface-water and bed material sample sites are considered to be associated

with LF5A.

Based on the potential pathways that exist at landfill 5A, as well as the current state of the landfill, there are two primary pathways by which contaminants can migrate to potential receptors.

Leachate generation and subsequent migration to the underlying soil and ground water is the most significant pathway at landfill 5A. This mechanism may occur as the result of rain water infiltration and reaction with landfill contents to generate leachate, or by the leakage of non-aqueous phase liquids (NAPLs) from the landfill to ground water. This mechanism is evident at LF5A by the development of a TCE plume emanating from the landfill. During transport by ground water, contaminants may undergo degradation and transformation reactions that produce additional contaminants over time. Plume size is a function of the mass of the contaminants released to the ground aquifer, the rate of ground-water flow, and the retardation of the contaminants within the plume relative to ground-water flow. Given the characteristics of a typical landfill, it is possible that a near-continuous source is present, which would result in continued development of the plume down gradient of the landfill.

Contaminant transport by overland flow of surface water is considered a potential migration pathway, although it is probably minor due to the semiarid climate and the relatively flat topography of the site. However, contaminant transport may occur during periods of heavy rainfall or rapid snow melt.

Airborne dispersion of volatilized organic compounds and fugitive dust emissions are aspects of the second pathway. Organic contaminants in soil at LF5A consist of SVOCs that are readily sorbed to particulates and susceptible to transport. Inorganic contaminants consist of metals that also exist primarily in the solid phase and thus are readily transported by wind. Although the landfill has a soil and grass cover, without knowledge of the design, depth, and condition of the cover, future direct contact with the landfill contents cannot be precluded, if the selected remedy is not implemented.

6.0 SUMMARY OF SITE RISKS

A streamlined risk assessment (SRA) was conducted for LF5 to determine the potential human exposures and risks from chemicals under baseline conditions. The ground-water indicator contaminants of concern (ICOCs) are: Trichloroethylene (TCE), cis- 1,2-dichloroethene, and vinyl chloride.

Landfill 5 is the source of several chemicals found at concentrations in excess of Federal drinking water standards. The most prevalent is trichloroethylene (TCE), considered to be a suspected carcinogen. The carcinogenic risk from exposure to TCE in ground water is within the target risk range of 10 -4 to 10 -6 (1 in 10,000 to 1 in 1,000,000). Vinyl Chloride, a known carcinogen, accounted for the highest risk of 6.8 x 10 -4, at LF5A.

Potential carcinogenic health effects were identified on the basis of the reasonable maximum exposure (RME) calculations for both the residential and occupational scenarios. The risk-based equations used to compute the preliminary remediation goals (PRGs) were derived to reflect the potential risk from exposure to a single chemical, given a specific pathway, medium, and land-use combination.

The use of the PRGs serves a two-fold purpose for risk characterization. First, the comparison of the site and COC-specific RME concentration with the corresponding PRG gives an immediate indication that a potential risk may exist when the PRG concentration is exceeded. Second, the risk corresponding to the site and COC-specific RME can be calculated. Both of these functions are useful when performing a risk screening. Also, as part of the risk characterization phase of this SRA, the highest potential cumulative risks associated with ground water were determined on the basis of a one acre residential plot exposure unit area. The following is a summary of the SRA findings:

- Residential Carcinogenic Ground Water Risk: The residential carcinogenic ground water risk was estimated to range from 1.2 x 10 -6 to 6.8 x 10 -4

  Vinyl Chloride accounted for the four highest potential risk estimates at LF5A.

- Occupational Carcinogenic Ground Water Risk: The occupational carcinogenic ground water risk was estimated to range from 1.0 x 10 -6 to 3.5 x 10 -4.

Potential non-carcinogenic health effects were identified on the basis of the RME calculations for both residential and occupational exposure scenarios. No ICOC demonstrated a Hazard Quotient exceeding 1.0.

Although an ecological investigation was conducted, an ecological risk assessment was determined to not be necessary since the remedy (capping the landfill) will mitigate any ecological risks.

The selected interim action will:

- Decrease the potential for contamination of ground water by reducing the movement of contaminants from the landfill.

- Provide protection against direct contact with the landfill contents.

- Control surface water (both run on and ran off) and erosion.

- Provide protection to human health by eliminating exposure to contaminant vapors and contaminated dust particulate.

- Eliminate direct contact with the landfill contents by constructing a cap over the landfill, meeting RCRA landfill closure requirements, and implementing deed restrictions to prohibit residential development of the site.

- Reduce the potential for landfill gas migration by installing an active landfill gas venting and control system. The number of gas vents and/or controls shall be determined during the remedial design. The landfill gas venting system shall meet ARARs.

The function of this interim action is to control LF5A as a source of ground-water contamination by reducing infiltration and the downward movement of contaminants to the ground water and to reduce the risks associated with exposure to contaminated materials.

Actual or threatened releases of hazardous substances from the landfills, if not addressed, may present a current or potential threat to public health and the environment.

7.0 DESCRIPTION OF ALTERNATIVES

Three alternatives for the interim remedial action were evaluated as part of the detailed analysis in the focused feasibility study. All three alternatives are summarized in this section. None of the alternatives are expected to be the final remedy for LF5A. Institutional controls are included for all alternatives. The purpose of these institutional controls is to limit direct exposure to landfill contents and contaminated soils and to protect the integrity of the remedy. Deed restrictions will not allow subsurface development (excavation) or excessive vehicular traffic at LF5A. Implementing institutional controls will include:

- A continuing order of the Base Commander requiring implementation of the landfill restrictions as long as the property is owned by F.E. Warren AFB.

- Upon completion of construction at LF5A, the Air Force will file notice of these restrictions in the real- property records of the county in which the landfill is located. Before transfer of the property, the Air Force Aill provide a deed covenant notifying the transferee of the locations and the restrictions on the use of the areas.

- Fencing the landfill area and placing warning signs for the duration of the remedial action. Additional deed restrictions may be required for effective implementation of other technologies.

Alternative 1 is no action. Evaluation of the "no action" alternative is required by the National Contingency Plan to be used as a baseline comparison for other alternatives. Under this alternative the Air Force would take no action at the landfill to prevent exposures to contamination.

Alternative 2 consists of a simple compacted soil cap with a gas venting and control system. This cap would be designed to meet Resource Conservation and Recovery Act (RCRA), subtitle D, landfill closure requirements, so as to reduce infiltration of water from the ground surface to the landfill contents, provide protection against direct contact with the landfill contents, and eliminate exposure to contaminant vapors and contaminated dust particulate.

The exact construction specifications of the cap will be determined during the Remedial Design stage. A typical single-barrier compacted-soil cap consists of a compacted clay layer overlain by a gravel drainage layer. A final soil layer and vegetative soil layer would be placed as a top cover to protect the cap from erosion and other weather effects. Surface water diversion and erosion and ponding prevention would be included as an integral part of the topsoil grading design. Methane gas would be controlled with an active venting system, where pumped gas vent wells are used to provide positive reduction of gas pressures. The potential of VOCs to be in the soil gas will be investigated during the remedial design. Uncontaminated cap and topsoil materials would be hauled to the landfill from a borrow source. Long-term periodic monitoring of ground water would be performed.

Alternative 3 is a composite cap with a gas venting and control system. This alternative consists

of the construction of a multiple-barrier cap to cover the surface of the landfill. This landfill cap would be designed to meet the landfill closure requirements of RCRA subtitle C, so as to reduce infiltration of water from the ground surface to the landfill contents, provide protection against direct contact with the landfill contents, and eliminate exposure to contaminant vapors and contaminated dust particulates.

A typical composite barrier consists of a compacted clay layer covered by a synthetic liner. This, in turn, is overlain by a drainage layer. A final soil layer and vegetative sod layer placed as a top cover serves to protect the cap from erosion and other weather effects. Surface water diversion and erosion and ponding prevention would be included as an integral part of the topsoil grading design. Any liquid that percolates through the top soil cover is collected by the drainage layer.. Methane gas would be controlled with an active venting system to provide positive reduction of gas pressures. The potential of VOCs to be in the soil gas will be considered during the remedial design. Uncontaminated cap and topsoil materials would be hauled to the landfill from a borrow source. Long-term periodic monitoring of ground water would be performed.

8.0 MONITORING WELL CONSTRUCTION

This section memorializes the agreement between the State and the Air Force, concerning appropriations of groundwater for on-base monitoring wells constructed, operated, and abandoned incident to clean-up activities undertaken by the Air Force at Operable Unit 8: Landfill 5A (OU8, LF5A). The State and the Air Force disagree on whether the Air Force is required to obtain permits from the State Engineer's Office pursuant to State law, whether the Air Force has a federal reserved water right covering groundwater at F.E. Warren Air Force Base (the Base), and whether Wyoming statutes, rules, and regulations pertaining to groundwater are ARARs. Despite these disagreements, however, the parties believe that the procedures described below will enable the Air Force to appropriate water for the required monitoring wells, while preserving the parties' legal and jurisdictional positions. By employing these procedures, the parties intend to avoid the necessity for protracted dispute resolution and/or legal action to resolve their legal and jurisdictional differences. The parties do not anticipate that the legal and jurisdictional issues will need to be resolved in the context of OU8 or in the context of the CERCLA clean-up at the Base. Consistent with this background, the purpose of these procedures is to effectuate the parties' desire that progress at OU8 continue, while ensuring that the legal and jurisdictional positions of the State and the Air Force are preserved in the event of a future dispute relating to appropriation of groundwater at OU8.

These procedures, and the reservation of jurisdictional and legal arguments, are only applicable within the context of water appropriation incident to construction, operation, and abandonment of monitor wells at the Base for the Air force's on-base CERCLA clean-up activities. The procedures set forth herein shall not be relied upon as precedent for any activities or water use or development outside the narrow context of the dispute concerning the Air Force's CERCLA clean-up, unless otherwise agreed to in writing by the parties.

By employing these procedures the parties are not waiving any arguments they may raise concerning the legal applicability of State law permitting requirements, or the designation of State law requirements as ARARs. In particular, but not by way of limitation, the parties each preserve their legal positions concerning: (1) Whether the Air force has a federal reserved water right covering use of water at the Base; (2) Whether Wyoming Statutes and the Regulations and Instructions of the State Engineer's Office are ARARs; and (3) Whether the permitting exemption contained in Section 9621(e)(1) of CERCLA applies to State permits for the appropriation of groundwater. In the event that a dispute or disagreement arises between the parties in the implementation of the procedures described herein; the parties expressly agree that any and all legal arguments and/or defenses are fully preserved and may be raised in any proceeding relating to the disputed issue.

The Air Force and the State agree to the following procedures relating to the appropriation of groundwater incident to the construction, operation, and abandonment of monitor wells at the Base during the CERCLA clean-up:

a. Prior to the construction of any wells, the Air Force will complete and submit to the State Engineer's Office, the State's standard form "Application for Permit to Appropriate Groundwater."

b. The Air Force will comply with all requirements for appropriating groundwater contained in Wyoming Statutes and Parts 2 and 3 of the Regulations and Instructions of the State Engineer. The Air Force fiifther agrees to submit a "Statement of Completion" on the standard State form, providing the information required therein.

c. The Air Force maintains that in providing information to the State on the State's forms and complying with State law procedures that it is not making application for a permit under State law, and further, that it is not required to follow State law for the appropriation of

federally reserved groundwater. It is the Air Force's position that it is only providing information to the State in the most usable and efficient format to enable the State to properly maintain its water records system, and cooperating with the State as a matter of comity. As provided in Paragraph II above, by submitting information on the State's forms and otherwise complying with State law, the Air Force does not waive its right to claim that no State permit is necessary or that the Air Force is not bound to follow State law in appropriating Groundwater for the CERCLA clean-up at the Base.

d. The State Engineer will treat the forms and information received from the Air Force as permit applications, and will issue permits in the name of the Air Force. The State Engineer will, in all respects, and in the same manner as for any private water appropriator, maintain its records and administer the permits in accordance with all applicable State law. As provided in Paragraph II, above, by following these procedures, the State does not waive its right to claim the Air Force is required to obtain State permits and follow State law in the appropriation of groundwater at the Base.

e. The parties agree to work in good faith to resolve any disputes or disagreements that may arise in the implementation of these procedures.

In the event that a dispute or disagreement arises from these procedures, and the parties are unable to resolve the matter through informal negotiation, the parties agree that an action to resolve the underlying jurisdictional and legal issues pertinent to appropriations of groundwater at OU8, may be maintained pursuant the FFA, Section 9621(e)(2) of CERCLA, or through any another applicable remedy provided for by law.

9.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Alternatives 2 and 3 are protective of human health and the environment because the cap will reduce the rate at which contaminants move to the water table and prevent direct exposure to surface contaminants. A reduction in the rate at which contaminants reach the water table will decrease the concentrations of those contaminants in the shallow aquifer. Compliance with Federal and State applicable or relevant and appropriate requirements (ARARs) relevant to the landfill cap will be assured.

Each of the alternatives has been evaluated against nine criteria established to provide a uniform basis for comparison.

1. Overall Protection: The "no action" alternative will not treat, remove, or provide any barrier other than the minimal existing cover to landfill contents. With no impediment to infiltration of precipitation, leaching and downward movement of contaminants will continue through the soil toward the water table if no action is taken. Airborne dispersion of volatilized organic compounds and fugitive dust emissions would remain a problem. The "no action" alternative does not guarantee overall protection of human health and the environment. This alternative is not considered further in this analysis as an option for the landfills. Both capping alternatives will prevent direct contact with landfill contents and contaminated dust. Both capping options will also prevent the transport of volatile organic compounds to the atmosphere and will reduce the rate at which chemicals move to the water table and are therefore protective.

2. Compliance with ARARs: Alternative 2 would comply with the relevant and appropriate RCRA subtitle D cap requirements but not subtitle C cap requirements. Alternative 3 would comply with RCRA subtitle C landfill closure requirements. RCRA subtitle C requirements are not considered applicable or relevant and appropriate for LF5A. Both capping alternatives would comply with other applicable or relevant and appropriate State and Federal environmental laws and regulatons, except for ground water chemical-specific ARARs which are temporarily waived using the interim measures waiver.

The Wyomiing Water Quality Rides and Regulations (WWQRR), Chapter XVII, Appendix A, risk assessment, and fate and transport procedures were considered by the State during the Feasibility Study and in selection of a remedy for this interim action. The State has determined that the selected remedy meets the intent of this regulation. The parties to this ROD agree that they will not raise non-inclusion of Chapter XVII of the WWQRR as an ARAR here as basis for an inconsistent application finding under 42 U.S.C. section 9621 (d)(4)(E) in any subsequent action where Chapter XVII is considered an ARAR.

A complete listing of the ARARs may be found at Appendix A Waived ground water ARARs may be found at Appendix B.

3. Long-Term Effectiveness and Permanence: The capping alternatives leave the landfill contents in place. Both alternatives require the same institutional controls and regular maintenance to ensure that the caps will continue to provide an appropriate level of protection against direct contact, air transport, and

erosion, as well as maintaining a barrier to infiltration. Transport of contaminants to the ground water is diminished by either cap since the reduction of infiltration lessens the amount of leachate produced. The composite cap is potentially more reliable than the compacted-soil cap because of the addition of the synthetic membrane liner.

4. Reduction of Toxicity, Mobility, and Volume through Treatment: Because no treatment technology is proposed under any of the alternatives, the considerations pertaining to treatment technologies are not relevant.

5. Short-Term Effectiveness: The initial preparation for placement of either cap on the landfills would cause disturbance of the existing ground surface. During this operation dust could be generated and volatiles, may be released to the air which would pose a minor, but temporary, risk to both workers and the surrounding community. These risks will be minimized by following health and safety procedures. Air monitoring will be used to assess the requirement for temporary control measures during construction.

6. Implementability: The two capping options have no serious implementability problems, and from a technical standpoint, implementation of either alternative should be fairly straightforward. Other than adhering to site safety requirements, no special techniques, materials, or labor would be required to prepare the site and place the compacted soil (single-barrier) cap. All materials and equipment can be obtained locally. The geosynthetics involved in the composite (multiple-barrier) cap require special handling techniques and labor for proper placement of the layers to ensure integrity. Contractors with the appropriate specialized experience are available.

7. Cost: The capital cost differences between the two capping alternatives is due entirely to the larger number of materials and special handling required for the composite cap. Yearly operation and maintenance costs are estimated to be the same for both alternatives. The comparison of the estimated project design and implementation costs is as follows:

Alternative 2, Compacted Soil Cap w/gas venting system, Landfill 5A	$4,342,000	
ALTERNATIVE 2, 30 YEAR PRESENT WORTH TOTAL		$5,546,000
Alternative 3, Composite Cap w/gas venting system, Landfill 5A	$5,814,000	
ALTERNATIVE 3, 30 YEAR PRESENT WORTH TOTAL		$7,023,000

8. State Acceptance: The State of Wyoming supports the preferred alternative as a partial remedy, but has expressed concerns regarding the potential for landfill contents to be in contact with ground water and for liquid wastes to be present in the landfill. These issues are more fully discussed in Section D., STATE CONCERNS, of the Responsiveness Summary for the Record of Decision.

9. Community Acceptance: The general community, consisting of the residents of the City of Cheyenne, Laramie County, and F.E Warren AFB support the preferred alternative based on comments received during the public comment period.

10.0 DESCRIPTION OF SELECTED REMEDY

The Air Force's selected interim remedy for OU 8, Landfill 5A is alternative number 2. This remedy involves the construction of a simple compacted soil cap that will meet RCRA subtitle D landfill closure requirements. The actual design will be determined during the Remedial Design. A typical cap would include a compacted clay layer overlain by a gravel layer. A final surface layer consisting of soil and vegetation would be used to protect the clay and gravel layers from erosion and other affects. Surface water diversion and ponding prevention would be included as an integral part of the topsoil design. Gas migration will be controlled by an active venting system. Long-term periodic monitoring of ground water would also be performed. Environmental monitoring to ensure the effectiveness of the interim action will be implemented. Institutional controls to limit direct exposure to landfill contents and contaminated soils, and to protect the integrity of the remedy will be implemented.

Institutional controls that will be implemented include:

A continuing order by the Base Commander requiring implementation of landfill restrictions as long as the property is owned by F.E. Warren Air Force Base;

Filing notice of landfill restrictions in the real-property records of the county in which the landfill is located;

Before transfer of the property, providing a deed covenant notifying the transferee of the locations and restrictions on the use of the areas and;

Fencing the landfill area and placing warning signs for the duration of the remedial action.

The estimated capital expenditure for this remedy as described in this ROD, including the design and construction of the proposed cap is approximately $4,342,000. The total operations and maintenance costs (O&M) over 30 years is estimated at $2,351,000. The present value of total estimated costs is $5,546,000. The actual cost are expected to be less than these amounts and will depend on the final design and performance of the cap.

The selected remedy for Landfill 5A is a source control action that includes capping and an active gas venting system. The selected remedy is designed to control the site as a source of ground water contamination by reducing infiltration and the downward movement of contaminants to the ground water, and to reduce the risks associated with exposure to contaminated materials.

Construction of a cap on Landfill 5A would begin within 15 months of the signing of this ROD. As an interim action, the preferred alternative is expected to be consistent with the final remedy for OU 8.

11.0 STATUTORY DETERMINATIONS

The Air Force's selected remedy for Operable Unit 8, Landfill 5A is alternative number 2. The selected remedy meets the statutory requirements of Section 121 of CERCLA as amended by SARA. These statutory requirements include protectiveness of human health and the environment, compliance with ARARs, cost effectiveness, utilization of permanent solutions and alternative treatment technologies to the maximum extent practicable and preference for treatment as a principal element. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The size of the landfill and the fact that there are no apparent on-site hot spots that represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. The selected remedy does comply with Section 300.403(a)(iii)(B) of the National Contingency Plan (NCP) which states that engineering controls, such as containment, should be used for wastes that pose a relatively low long-term threat or where treatment is impracticable. The preamble to the NCP identifies CERCLA municipal landfills as a type of site where treatment of the waste may be impracticable because of the size and heterogeneity of the contents. Subsequent remedial actions are planned to address ground water contamination associated with Landfill 5A.

Since ground water chemical-specific ARARs will not be met by this action, these requirements are temporarily waived using the interim measures waiver, granted through the signing of this Record of Decision. The interim measures waiver will not cause additional movement of contaminants, complicate the site response, present an immediate threat to public health or the environment, or interfere with or delay the final remedy. The ground water chemical-specific ARARs will be met in the final cleanup action for Operable Unit 8, Landfill 5.

12.0 EXPLANATION OF SIGNIFICANT CHANGES

The Proposed Plan was released for public comment in October, 1995. The preferred alternative was for a source control action that includes capping and an active gas venting system, and that this action is protective of human health and the environment. The USAF, EPA, and WDEQ reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes were necessary to the preferred alternative.

RESPONSIVENESS SUMMARY
RECORD OF DECISION
INTERIM ACTION
OPERABLE UNIT 8: LANDFILL 5A

INTRODUCTION

The responsiveness summary is organized into sections as follows:

A. Overview
B. Background on Community Involvement
C. Summary of Comments Received
D. State Concerns
Attachment A: Community Relations Activities at F.E. Warren Air Force Base

A. OVERVIEW

At the time of the public comment period, the preferred alternative for the interim action at Operable Unit 8, Landfill 5A, at F.E. Warren Air Force Base, had been selected by the Air Force, with EPA and Wyoming DEQ concurrence and was presented in the Proposed Plan. The preferred alternative is a source control action that includes capping and an active gas venting and control system.

Based on the public's response and comments received during the public comment period, there are no significant objections to the preferred alternative.

B. BACKGROUND ON COMMUNITY INVOLVEMENT

Community interest in CERCLA/IRP (Installation Restoration Program) activities at F.E. Warren Air Force Base has waxed and waned over the years since the records search and interviews conducted for the Air Force in September 1985. No specific individuals or organizations have been consistently involved over this period, although numerous groups and persons have been involved from time to time. There were no concerns expressed during the OU8, Landfill 5A, Remedial Investigation, prior to the public comment period.

C. SUMMARY OF COMMENTS RECEIVED

The public comment period on the Proposed Plan for the Operable Unit 8: Landfill 5A interim action at F.E. Warren Air Force Base was held from October 23, 1995 to November 21, 1995. A public meeting was held on November 7, 1995. Comments received during the meeting are summarized below. Similar comments have been combined where possible to prevent duplication of responses. There were no specific legal or technical questions.

A few questions were asked about why the remedial action was being done on the landfill first rather than on the associated ground water plume. It was explained that the proposed action will help stop further contamination of the ground water beneath the landfill and that the remediation of the ground water will follow this action.

Another question was asked about what contaminants are found in the ground water. These compounds were identified as: trans- 1,2-dichloroethene, cis- 1,2-dichloroethene, benzene, trichloroethene, chloride, nitrate, and sulfate. It was noted that this may not be a complete list because the investigation is continuing.

A final question was asked about the funding of the project. It was explained that this is a Superfund/CERCLA funded project using DOD environmental funds.

One comment was received by mail. The Wyoming Game and Fish Department wrote to support the selected alternative and made two suggestions. The first suggestion was ground water monitoring should be done no less than bi-monthly. The second was the need for setting contaminant levels that would trigger additional remedial action. The Air Force will consider their suggestions.

D. STATE CONCERNS

The State of Wyoming is concerned that waste materials contained in Landfill 5A may be residing in ground water at times when the water table is elevated. As has been described in the Record of Decision (ROD), the installation of a cap will significantly reduce the potential for precipitation to infiltrate the landfill contents and contribute to ground water leachate. However, the cap will not prevent the ongoing contamination of ground water if the landfill materials are in contact with ground water. Additionally, the potential for liquid wastes to be present in the landfill exists which would also constitute a source of

ground water contamination not addressed by the installation of the cap. For these reasons, the State of Wyoming supports the construction of the cap as a partial solution. The outstanding issues of direct contact between the landfill materials and ground water, and possible liquid wastes within the landfill are to be investigated and addressed during the remaining investigations and comprehensive ROD at the completion of investigation and feasibility studies for the site.

ATTACHMENT A
COMMUNITY RELATIONS ACTIVITIES
At
F.E. WARREN AIR FORCE BASE

OVERVIEW

The unique community involvement needs of F.E. Warren Air Force Base IRP/CERCLA activities are addressed in the Community Relations Plan (CRP). In late 1990, during plan development, interviews were held with 56 people representing F.E. Warren Air Force Base, other Federal agencies, State, city and county agencies, community groups, well owners, and other individuals. The most significant issues identified in the interviews were concerns about potential drinking water contamination and about the community involvement process.

OU 8: LANDFILL 5A RELATED ACTIVITIES

Operable Unit 8: Landfill 5 (includes subunits) has been addressed in Fact Sheets, Status Reports, newspaper advertisements and articles since Fact Sheet 1 was prepared, by the Air Force, in October 1990 for the initial interviews. Fact Sheet 1 was mailed in May 1991. After the Federal Facility Agreement became effective, a Status Report update was distributed on December 12, 1991, with information on all of the operable units. Since then, the quarterly status update reports have informed the public about OU 8 and Landfill 5 activities on a regular basis.

The Proposed Plan for OU8: LF5A was prepared in October 1995. A display advertisement concerning the Proposed Plan and the public meeting was placed in the Wyoming Tribune-Eagle and the Casper Star-Tribune on October 8, 1995. A copy of the Proposed Plan was sent to all persons on the mailing list about the same time. A copy of the Proposed Plan was placed in the Administrative Record and the Laramie County Library Records Repository in early October 1995. All of the newspaper advertisements and the mailings were coordinated between the Air Force, EPA and Wyoming DEQ before publication or distribution. In addition to the paid advertisements, the Air Force issued press releases which resulted in articles published in the Wyoming Tribune-Eagle on October 21 and 31, 1995, and the F.E. Warren Air Force Base Sentinel on October 13 and November 7, 1995. Radio announcements of the public meeting were made periodically in October and November 1995. A television report was shown on November 7, 1995.

There were a few comments received at the public meeting and in the mail. These are discussed in the Responsiveness Summary Section of this document.

The F.E. Warren AFB Restoration Advisory Board (RAB) was also briefed on and discussed the preferred alternative for LF5A.

ADMINISTRATIVE RECORD REPOSITORY

An Administrative Record Repository containing documentation of the IRP/CERCLA process was established in October 1989 and is maintained at the following locations to insure accessibility.

Information Repository	Administrative Record
Laramie County Library	90 CES/CEVR
Reference Section	Environmental Restoration Section
2800 Central Avenue	300 Vesle Drive, Suite 600
Cheyenne WY 82001	F.E. Warren AFB WY 82005-2793
Phone (307) 634-3561	Phone (307) 775-3468

These records are maintained according to EPA guidelines, by the Environmental Restoration Flight, and are updated at least quarterly. The Administrative Record Repository also functions as the required information repository. A copy of the Administrative Record is housed in the Laramie County Library reference section to insure public access.

RESTORATION ADVISORY BOARD

In an effort to improve public participation in environmental cleanup activities at F.E. Warren Air Force Base, a Restoration Advisory Board (RAB) has been formed to replace the Technical Review Committee. The RAB consists of community volunteers and representatives from the Base, EPA and WDEQ. It is chaired by a community member and a senior base official.

The board offers community members the opportunity to provide input to the decision making process used by the base to clean up contaminated sites.

MAILING LIST

A major part of the public relations activities is the mailing list. In an attempt to proactively contact the 2,300 well owners identified in the EPA Superfund ranking, F.E. Warren sent a general mailing to well owners within a 3-mile radius. The Wyoming State Engineer's Office provided the mailing list of well owners. The mailing included a brief status report and a coupon to be mailed back if the well owner wanted to be added to the mailing fist for distribution of later status reports. This activity resulted in the current fist that has about 600 names on it. The mailing list is maintained in the F.E. Warren Air Force Base Public Affairs Office. Status Reports or Fact Sheets are mailed on a quarterly basis. Anyone who desires to be included on the list should contact either of the following offices.

90 CES/CEVP
300 Vesle Drive, Suite 600
F.E. Warren AFB WY 82005-2788
Phone (307) 775-4154

90 CES/CEVR
300 Vesle Drive, Ste 600
F.E. Warren AFB WY 82005-2793
Phone (307) 775-3468

INFORMATION CONTACT

An information contact person has been designated within the F.E. Warren Air Force Base Environmental Restoration Section to maintain regular contact with the community. This person is responsible for responding to requests for information and planning and scheduling activities included in the plan. The preparation of materials for public distribution will be coordinated with the Public Affairs Office. General public information requests should be directed to (307) 775-3468. The media contact for F.E. Warren Air Force Base is the Environmental Public Affairs office at (307) 775-4154.

Appendix A

Federal and Wyoming State
Applicable, or Relevant and Appropriate Requirements (ARARs)
For Landfill 5A at F.E. Warren AFB

Table A-1 -Federal Chemical-Specific ARARs

[USC, United States Code; CFR, Code of Federal Regulations; Statute; Exec., Executive; DOT, Department of Transportation; FS, Feasibility Study]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Clean Air Act	42 USC 7401-7642			
National Emission Standards for Hazardous Air Pollutants	40 CFR 61, Subpart A	Establish regulatory standards for specific hazardous air pollutants	No/yes	Current assessments indicate regulation is not relevant and appropriate, but venting of landfill gases reaching regulatory thresholds could possibly make this regulation relevant and appropriate.
Standards of Performance for New Stationary Sources	40 CFR 60, Subpart WWW	Establish performance standards for venting of landfill gases as a type of new stationary source	Yes/NA	Interim action remediation may involve venting or treating of landfill gasses.

Table A-2 - State Chemical - Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute; Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Wyoming Environmental Quality Act	W.S. 35-11-101 to 35-11-1428			
	W.S. 35-11-201	Discharge or emission of air contaminants	Yes/NA	Compliance with state air quality numeric and other substantive requirements identified as ARARs satisfies all requirements of this provision.
	W.S. 35-11-301	Prohibits certain acts without a permit	Yes/NA	Although there is no federal counterpart which meets or exceeds the requirement that there be no threat to pollute the waters of the state, the selected remedy of a RCRA subtitle D cap will comply with and meet the intent of this requirement for this interim action. The selected remedy will adequately reduce any threat to groundwater or surface water quality from migration of landfill contaminants resulting from infiltration or surface runoff of precipitation. Further, compliance with state water quality substantive requirements (permits are notrequired) identified as ARARs satisfies all requirements of this provision.
Wyoming Water Quality Rules and Regulations				
	Chapter I, Section 18	Human health values	Yes/NA	Not applicable unless affected waters upgraded to class 2.
	Chapter I, Section 21 (a-c)	Protection of aquatic life	Yes/NA	Ammonia is not anticipated and monitoring is not required.
	Chapter I, Section 22	Radioactive material	Yes/NA	Radioactive materials are not anticipated and monitoring is not required.
	Chapter I, Section 23(a-b)	Turbidity	Yes/NA	Section 23(a) is not applicable unless affected waters are upgraded to class 2.
	Chapter I, Section 24	Dissolved Oxygen	Yes/NA	Not applicable unless affected waters upgraded to class 2.

Table A-2 - State Chemical - Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute; Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
	Chapter I, Sections 25-27	Temperature, pH, fecal coliform bacteria	Yes/NA	
	Chapter I, Section 9	Oil and grease	Yes/NA	Primarily applicable during the construction of the landfill cap, and although discharges are not anticipated, may be applicable during any maintenance of the cap,
	Chapter XVII, Appendix A, Sections III and IX	Underground Storage Tanks	No/No	Please see discussion in Decision Summary, section 9.

Table A-3 - Federal Action - Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute; Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Clean Water Act	33 USC 1251-1376			
NPDFS Storm Water Regulations	40 CFR 122	Establishes requirements for discharge of storm water	Yes/NA	Storm water runoff may occur from the site making substantive requirements applicable.
Clean Air Act	42 USC 7401-7642			
National Emission Standards for Hazardous Air Pollutants	40 CFR 61, Subpart A	Establish regulatory standards for specific air pollutants	No/Yes	Current assessments indicate regulation is not relevant and appropriate, but venting of landfill gases reaching regulatory thresholds could possibly make this regulation relevant and appropriate.
Standards of Performance for New Stationary Sources4	40 CFR 60, Subpart WWW	Establish performance standards for venting of landfill gases as a type of now stationary source	Yes/NA	Interim action remediation may involve venting or treating of landfill gasses.
Resource Conservation and Recovery Act				
Criteria for Municipal Solid Waste Landfills	40 CFR 258	Establishes design and operational requirements for municipal waste landfills (RCRA Subtitle D)	No/yes	Landfill 5 operation ceased before promulgation of regulation. Closure requirements may still be relevant and appropriate.

Table A-4 - State Action-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute; Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Wyoming Environmental Quality Act	W.S. 35-11-101 to 35-11-1428			
	W.S. 35-11-201	Discharge or emission of air contaminants	Yes/NA	Compliance with state air quality numeric and other substantive requirements identified as ARARs satisfies all requirements of this provision.
	W.S. 35-11-301	Prohibits certain acts without a permit	Yes/NA	Although there is no federal counterpart which meets or exceeds the requirement that there be no threat to pollute the waters of the state, the selected remedy of a RCRA subtitle D cap will comply with and meet the intent of this requirement for this interim action. The selected remedy will adequately reduce any threat to groundwater or surface water quality from migration of landfill contaminants resulting from infiltration or surface runoff of preprecipitation. Further, compliance with state water quality substantive requirements (permits are not required)identified as ARARs satisfies all requirements of this provision.
	W.S. 35-11-502(a)	Solid Waste Management Facilities	Yes/NA	Only substantive standards apply, and permits are not required.
Wyoming Air Quality Standards and Regulations				
	Section 14	Control of particulate emissions	Yes/NA	Primarily applicable during the construction of the landfill cap, and although such emissions are not anticipated, may be applicable during any maintenance of the cap.
	Section 16 (a, c)	Odors	Yes/NA	No monitoring required.
	Section 19	Abnormal conditions and equipment malfunctions	Yes/NA	Primarily applicable during the construction of the landfill cap, and although such emissions are not maintenance of the cap.

Table A-4 - State Action-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute; Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
	Section 21 (c)(v) & (j)	Permit requirements for construction, modification and operations	Yes/NA	
Wyoming Water Quality Rules and Regulations				
	Chapter I, Section 11 (a-b)	Flow conditions	Yes/NA	Applies if there are discharges if sedimentation ponds are constructed.
	Chapter I, Section 15, 16, 17 (a-c)	Settleable solids, floating and suspended solids, and taste, odor and color	Yes/NA	Primarily applicable during the construction of the landfill cap, and although discharges are not anticipated, may be applicable during any maintenance of the cap.
	Chapter III, Section 4(e)	Prohibition on discharge of wastes to treatment works	Yes/NA	
	Chapter III, Section 6(d), 7(c), 8 (a-f)	Construction, Installation or Modification of Facilities Capable of Causing or Contributing to Pollution	Yes/NA	Substantive provisions apply, but no permits, required.
	Chapter IV, Section 4(a)(i, iii), (b-c), 5, 7 and 8	Releases of oil and hazardous substances	Yes/NA	Although there is no federal counterpart which meets or exceeds the requirement that there be no threat to pollute the waters of the state, the selected remedy of a RCRA subtitle D cap will comply with and meet the intent of Section 5 for this interim action. The selected remedy will adequately reduce any threat to groundwater or surface water quality migration of landfill contaminants resulting from infiltration or surface runoff of precipitation. Further, compliance with state water quality substantive requirements (permits are not required) identified as ARARs satisfies all requirements of Section 5.
Wvoming Solid Waste Management Rules and Regulations				
	Chapter 2, Section 7	Sanitary Landfill Regulations	Yes/NA	Interim action qualities as part of the process of closure.

Table A-4 - State Action-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L,, Public Law; Stat., Statute., Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
	Chapter 8, Section 3(b)(i& ii) and 4(c)(iii-v)	Special Waste Management Standards	Yes/NA	Substantive requirements within this regulation apply if landfill contains asbestos.
	Chapter 15, Section 11(d,l, m, p & q)	Wyoming Solid Waste Management Rules and Regulations, 1975	Yes/NA	Requirements more stringent than 40 CFR 258 apply.

Table A-5 - Federal Location-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; P.L., Public Law; Stat., Statute, Exec., Executive; DOT, Department of Transportation]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments

Table A-6 - State Location-Specific ARARs

[CFR, Code of Federal Regulations; P.L., Public Law; W.S,, Wyoming Statute]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Wyoming Water Quality Rules and Regulations	Chapter I, Appendix A	Quality Standards for Wyoming Surface Waters	Yes/NA	Classifications of Diamond Creek, Crow Creek and unnamed tributary apply. ARARs for upgraded stream classifications apply,

Appendix B

Temporarily Waived Federal and Wyoming State Applicable, or Relevant and Appropriate Requirements (ARARs)

Table B-1 - Federal Chemical-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; Statute; Exec., Executive; DOT, Department of Transportation, FS, Feasibility Study]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Safe Drinking Water Act	42 USC 300g			
National Primary Drinking Water Regulations	40 CFR 141, Subparts B and G	Establish health-bascd standards for the public water systems (maximum contaminant levels)	No/Yes	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of groundwater will be addressed in subsequent actions.
Maximum Contaminant Level Goals (MCLGs)	40 CFR, Subpart F	Establish drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety	No/Yes	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of groundwater will he addressed in subsequent actions. Relevant and appropriate only for constituents of concern with an MCLG greater than zero.

Table B-2 - State Chemical-Specific ARARs

[USC, United States Codes; CFR, Code of Federal Regulations; Statute, Exec., Executive; DOT, Department of Transportation; FS, Feasibility Study]

Standard requirement, criteria, or limitation	Citations	Description	Applicable/ Relevant and Appropriate	Comments
Wyoming Water Quality Rules and Regulations				
	Chapter VIII	Quality Standards for Wyoming Groundwater	Yes/NA	Groundwater is a potential or actual source of drinking water. This interim action is due to groundwater contamination. The cleanup of ground water will be addressed in subsequent actions. Regarding Section 1, compliance with other state water quality substantive requirements (permits are not required) identified as ARARs satisfies all requirements of this provision.